Claims

That which is claimed is:

1. An isolated peptide consisting of an amino acid sequence selected from the group consisting of:

(a) the amino acid sequence of a variant estrogen receptor protein provided in Figure 2;

(b) a fragment of the amino acid sequence of a variant estrogen receptor protein provided in Figure 2, wherein the fragment comprises at least 10 contiguous amino acids.

2. An isolated peptide comprising an amino acid sequence selected from the group consisting of:

(a) the amino acid sequence of a variant estrogen receptor protein provided in Figure 2;

(b) a fragment of the amino acid sequence of a variant estrogen receptor protein provided in Figure 2, wherein the fragment comprises at least 10 contiguous amino acids.

3. An isolated antibody that selectively binds to a peptide of claim 1.

4. An isolated nucleic acid molecule consisting of a nucleotide sequence selected from the group consisting of:

(a) a nucleotide sequence that encodes the amino acid sequence of a variant estrogen receptor protein provided in Figure 2;

(b) a nucleotide sequence that encodes a fragment of the amino acid sequence of a variant estrogen receptor protein provided in Figure 2; and

(c) a nucleic acid molecule that is the complement of a nucleic acid molecule of (a)-(b).

5. An isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:

(a) a nucleotide sequence that encodes the amino acid sequence of a variant estrogen receptor protein provided in Figure 2;

(b) a nucleotide sequence that encodes a fragment of the amino acid sequence of a variant estrogen receptor protein provided in Figure 2; and

(c) a nucleic acid molecule that is the complement of a nucleic acid molecule of (a)-(b).

6. A nucleic acid vector comprising the nucleic acid sequences of claim 4.

7. A nucleic acid vector comprising the nucleic acid sequences of claim 5.

8. A host cell containing the vector of claim 6.

9. A host cell containing the vector of claim 7.

10. A method for producing any of the peptides of claim 1 comprising introducing a nucleotide sequence encoding any of the peptide sequences in (a)-(b) into a host cell, and culturing the host cell under conditions in which the proteins are expressed from the nucleic acid.

11. A method for producing any of the peptides of claim 2 comprising introducing a nucleotide sequence encoding any of the peptide sequences in (a)-(b) into a host cell, and culturing the host cell under conditions in which the proteins are expressed from the nucleic acid.

12. A method for detecting the presence of any of the peptides of claim 1 in a sample, said method comprising contacting said sample with an agent that specifically allows detection of the presence of the peptide in the sample and then detecting the presence of the peptide.

13. A kit comprising reagents used for the method of claim 12, wherein the reagents comprise an agent that specifically binds to said peptide.

14. A method for detecting the presence of a nucleic acid sequence of claim 4 in a sample, the method comprising contacting the sample with an oligonucleotide that hybridizes to the nucleic acid sequences under stringent conditions and determining whether the oligonucleotide binds to the nucleic acid sequence in the sample.

15. A kit comprising reagents used for the method of claim 14, wherein the reagents comprise a compound that hybridizes under stringent conditions to any of the nucleic acid molecules.

16. A method for identifying an agent that binds to any of the peptides of claim 1, said method comprising contacting the peptide with an agent and assaying the contacted mixture to determine whether a complex is formed with the agent bound to the peptide.

17. A method of identifying an individual having or at risk of developing a disorder mediated by a variant estrogen receptor comprising the step of analyzing nucleic acid molecules isolated from said individual for alterations in the estrogen receptor gene sequence, wherein an alteration in said estrogen receptor gene selected from the group consisting of the variants provided in Figure 2 identifies an individual as having or at risk of developing said bone disorder.

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